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Does Graduate Education Deserve NDEA Support?

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The power of US contemporary technological society is generated in the universities --especially in graduate schools-- but if graduate education fails to contribute substantial benefits to society, it should not be awarded indefinite financial support from the federal government. The comfort, power, and prosperity enjoyed in our age are accompanied by interrelated hazards such as pollution, war, poverty, famine, noise, disturbed ecological balances, loss of privacy, and crumbling social and political institutions. Criticism of the narrow specialization of graduate education can no longer be ignored, since there is a desperate need for people with generalist outlooks who are interested in how their disciplines may erase some of the ills that afflict modern civilization, and who can deal with complexity rather than with simplified abstractions. Future scientists should be instilled with a sense of responsibility to increase the understanding of science by the public at large, and to alert society to the perils brought about by scientific applications that are unfavorable to human welfare. Graduate departments should relate individual disciplines to other disciplines, to the needs of society, and to legal, moral, or other issues that are appropriate. These changes would expand educational perspectives and provide room for novel elements, yet they would not preclude the achievement of specialized competence in established fields. (WM)

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Richard L. Predmore

DOES GRADUATE EDUCATION DESERVE NDEA SUPPORT?

In this tenth-anniversary year of the National Defense Education Act, perhaps the Council of Graduate Schools should be asking, How can a truly effective campaign be mounted to persuade the Congress to fund the Title IV Fellowships at a level commensurate with our needs? I think such a campaign should be mounted, and I think there is some chance it would produce more adequate support for a few years. But in the long run it behooves the leaders of graduate education to ask whether the segment of higher education over which they preside is doing well enough by society to warrant society's generous support. I do not take for granted an affirmative answer to this question, and I intend to take advantage of the freedom accorded me by President Arlt to explore it with you this morning. Substantial federal support of graduate education, such as has been provided by the National Defense Education Act, cannot be expected to continue indefinitely unless it can be demonstrated that substantial benefits to society result from that support.

In the next fifteen minutes I should like to reflect upon the precarious condition of the world, proceed to inquire whether graduate education bears any responsibility for that condition, and go on to suggest in what ways it does and how something constructive might be done about it. Neither my interpretation of the current situation nor the remedies I propose pretend to be utterly novel. On the other hand, I would not have bothered to write this paper if I had believed its message to be sufficiently reflected in the current practices of graduate education.

I have a file full of quotations by all sorts of distinguished men so worried about the state of the world that at certain points in their speaking and writing they sound more like Old Testament prophets of doom than they do like professors and writers. The things that worry them are the familiar problems of pollution, disturbed ecological balances, diminishing

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natural resources, overcrowding, poverty, famine, noise, loss of privacy, war, crumbling social and political institutions, and other similar ills. I will not take the time required to record representative samples of the worried comments I have collected. I will merely say that for some informed commentators "worry" would be too weak a word. Responsible thinkers have gone so far as to inquire whether there is still time to save our civilization or whether we have set in motion processes that are already irreversible and ultimately disastrous. But what does all this have to do with us as graduate deans? Let me attempt a first answer to this question with some broad statements that may contain elements of exaggeration, but that may also have the virtue of vigorously calling attention to possible dangers worth pondering.

All of the evils listed in the preceding paragraph are more or less inter-related, and all are associated in one way or another with our contemporary technological civilization. Since the advent of Sputnik I, it has become increasingly clear that the power of our technological civilization is generated in our universities, particularly in their graduate schools. We have tended quite naturally to take satisfaction in the comfort, power, and prosperity that we have helped to create. But—almost overnight it seems—what were held to be the very contributions of our universities to society are being called into question by all kinds of people, including our restless and dissatisfied students. They believe that our universities not only tend to reflect the society in which they exist but also to reinforce its present tendencies and to accelerate its future evolution. If there is any validity to this statement, then perhaps it is fair to formulate another one even more explicitly alarming: If perchance society is evolving, like the ancient dinosaurs, in ways inimical to its chances of survival, then university contributions to its evolution along present trend lines will hasten its final destruction. If graduate deans are able to find even a kernel of truth in this proposition, they are thereby gravely reminded that graduate education will not long continue to receive generous support unless it is able to contribute in a creative and civilizing way to the revolutionary changes through which society seems destined to pass.

I do not suggest that graduate education is directly responsible for the major ills that afflict society. All that I suggest for the moment is that it trains specialists to satisfy the advanced personnel needs of a society in bitter crisis, and a society that seems to operate largely on the assumption that the vast complexities of our age can be handled so long as we produce enough specialists to match the supposed needs of all the components of these complexities. As you all know, the "narrow specialization" of graduate education has long been the subject of much criticism. I am coming to believe that we have taken that criticism too lightly, and that it is naive

to think that any number of specialists acting as specialists can be expected to solve the big problems of our age. Indeed, one of the crowning ironies of our age may be that our highest educational endeavor concentrates on the training of narrow specialists while our most desperate need is for people capable of dealing not with simplified abstractions from reality but with reality in something like its full complexity.

The kind of individuals I suggest are in short supply are often called generalists. You may think I am leading up to a call for formal graduate programs aimed at producing generalists, but such is not the case. I don't know anybody confident he understands the secret of training generalists nor to what department or departments the mission of training them could be assigned, nor anyone likely to trust a newly created department of generalities; and even if all these obstacles did not exist, there is scarcely room enough in a Ph.D. program for most students to achieve competence in one major field. Still, is it not possible that their education could be conducted in such a way as to encourage a greater awareness of the contemporary world and a concerned sense of what their disciplines might contribute to the grave problems that beset it? Sometimes their concern might reveal itself in research applied to those problems, but what I am really urging is the attempted inculcation of attitudes and habits of mind that might go a long way toward equipping specialists to function as generalists. Let me illustrate what I mean by applying this notion to the training of future scientists. I shall devote more attention to them than to prospective humanists and social scientists, not because of my competence in science but because science has become for good and ill so potent a force in the modern world.

A possible place to start this part of the discussion might be Archibald MacLeish's recent statement that science and technology can no longer be allowed to invent whatever worlds they happen to invent, or with René Dubos's statement that we must not ask where science and technology are taking us but rather how we can manage science and technology so that they can help us get where we want to go.¹ I do not mean to insinuate through the words of these men that individual scientists should be held accountable for whatever applications of their scientific discoveries happen to be made. Nevertheless, it is true that many of science's great conquests over nature are followed by the sinister shadows of the equally great problem arising out of them. Of all the citizens of our country, scientists are the ones best equipped to understand these problems and to alert society to their hazards. Of course, there are scientists already playing this role; but just as there are humanists fairly accused of living in ivory towers,

¹ *Saturday Review*, July 13, 1968, pp. 15-16.

so are there also scientists enthralled in their laboratories, apparently not interested in the ultimate consequences of what they are doing. So one thing graduate departments of science might usefully try to do in a conscious and continuing way is to instill in their students some sense of responsibility to help protect society against the probable consequences of whatever applications of science appear unfavorable to human welfare.

A second area to which scientists might well pay increasing attention is that of science education for the non-specialist. For reasons too obvious to mention, it is imperative that science be better understood among the public at large. To accomplish this purpose effectively, graduate students in science should be brought up to understand that the enlargement of public understanding of science is as worthy of their best efforts and as important to their continuing success as their personal research. One way of undertaking this responsibility would be by the imaginative creation of undergraduate courses not primarily intended to produce more science majors but to enhance the potential usefulness of general education.

As we turn now from graduate education in the sciences to graduate education in the social sciences, would it be fair to ask a question like this: Assuming that universities may properly be expected to allocate their material resources and human energies with some regard to the perilous state of the world, *what sort of research seems likely to make the greater contribution to human welfare (not to mention human survival), research designed to throw new light on the unsolved problems of nuclear physics and molecular biology or research designed to throw new light on problems of poverty, of race relations, and of war and peace?* If it is the second group of problems, could one discover this by analyzing the research publications of social scientists and their graduate students? I believe the answer is No; and it may be that some of the serious problems of our day cannot be solved by any presently known methods of empirical research. Even if for the present this were admitted, are there not important issues to be clarified and goals to be suggested? Those who are themselves social scientists will know better than I how much of a case can be made for conducting the graduate training of their students in such a way as to encourage a sense of responsibility for the social relevance of their disciplines. If not much of case can be made, it is hard to imagine in the near future a generously supported National Foundation for the Social Sciences.

I would guess that academic humanists as a group pay less attention to the real world about them than do the scientists and social scientists I have been criticizing. Some of them have done superb work within the narrowly defined frontiers of their disciplines, but if one were to attempt to judge them by their effectively expressed concern over the major problems of our times, by their eagerness to inform themselves of the forces and

conditions that create those problems, or by their conscientious efforts to teach their subjects in ways calculated to prepare their students to face today's world and if possible to contribute to the re-humanizing of it, I am afraid the judgment would not be so favorable. In fact, some would reject any intimation that they were obliged to find in their subjects any relevance to life in the final decades of the twentieth century. I hope this attitude will not prevail, because many signs suggest that today the humanities are wanted and needed more than at any time in recent memory. If this is true, it presents renewed opportunity for academic humanists to enlarge their usefulness.

As you can see, what I am finally getting around to is the ancient question of what education is for. If it is for the improvement of human life, then we have also to ask whether it can be managed with the deliberate intent of achieving that goal. All of us would like to assume that what we were doing was pointed in that direction, but it is not clear how much management we would willingly tolerate. In fact, it is a delicate matter even to formulate what I am trying to say without appearing to attack some of the articles of faith on which we were raised, such as, "knowledge is its own excuse for being," and "the truth shall make you free." The trouble is that we live in a time when the pursuit of one kind of truth can lead to Hiroshima. Even in the light of such sobering thoughts as that, I am not advocating that graduate education proscribe any areas of intellectual activity, but only that it go about its business deeply aware of the state of the world and of its responsibilities in such a world. I don't believe it generally does at present.

Let me end this jeremiad with a few possibly practical suggestions for educating specialists in such a way that they might turn out to be more than specialists. On many campuses graduate departments organize bi-weekly or monthly colloquia to bring distinguished professors to speak to their students. I observe on my own campus that these speakers often use their meetings with students and staff to describe their latest research. I am sure that this is frequently valuable and interesting, but it isn't likely to contribute to the student's education any new understanding of his discipline viewed in relation to something bigger than his discipline. Why couldn't more of these colloquia be devoted to a discussion of a discipline as it appears to relate to other disciplines, to long-range developments and possible applications, to the needs of society, to relevant questions of public policy, to legal and moral issues, or to whatever other issues might be appropriate to the individual disciplines?

If I were chairman of a graduate department and free to innovate, I would invite each year a distinguished professor from another department to give a one-semester course on whatever aspect of his specialty he con-

sidered of broadest interest and value to non-specialists. Not all of the invited professors would accept my invitation and not all of the courses given by those who did accept would turn out to be good or even appropriate. Nevertheless, is it ridiculous to suppose that some of the invited professors would create memorable courses out of the opportunity to relate their special insights and knowledge to general culture, and that some of my majors would acquire in their courses new perspectives otherwise difficult for them to attain? Do you find it hard to imagine benefit to students of the humanities from a one-semester course called "Humanistic Biology" given by René Dubos? (I take the title for this imagined course from an article published by him in *The American Scholar*, Spring 1965.) Or what about a course called "Science and Human Values" offered to philosophy students by J. Bronowski? Or a course on linguistics for psychology students by Noam Chomsky? These names are meant to be suggestive only. The idea is to try to shake up some of the old modes of thinking.

Still pursuing the idea of enlarging perspectives without sacrificing sound training in the student's major field, I would suggest that he be allowed to choose a minor with no limitations whatsoever as to subject matter. He could include in his minor one or more of the special courses alluded to above or he could elect graduate courses from other departments. Whatever the minor he put together, he would be expected to pass an examination in it and to defend its inclusion in his Ph.D. program. As you can see, I wish to allow graduate students to assume an enlarged responsibility for their own graduate programs, even if this involves the introduction into those programs of utterly novel elements. There is surely a chance that some of the elements might be found worthy of imitation by other students in the field.

To sum up, should not graduate education be organized in such a way as to encourage the sympathetic consideration of change rather than to resist it? I think it should, and I suggest that the attitudes and practices proposed in this paper would contribute to that end and would help to cure the deficiencies of extreme specialization, without preventing the achievement of specialized competence in established fields. I believe it is always good for a discipline to subject itself to some pressure for change, whether this pressure stems from the close-range attraction of other disciplines or from the personal interests of individual students. I believe that disciplines willing to subject themselves to such pressures will be strengthened rather than weakened, and, above all, I believe they will find themselves in better condition to serve a society whose present values are in crisis and whose future values remain to be discovered.